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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,108	08/17/2001	Jennifer L. Steichen	YOR920010657US1	3627

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McGuire Woods LLP
Suite 1800
1750 Tysons Boulevard
McLean, VA 22102-3915

EXAMINER	
JARRETT, SCOTT L	

ART UNIT	PAPER NUMBER
3623	

DATE MAILED: 08/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/931,108	STEICHEN ET AL.	
	Examiner	Art Unit	
	Scott L. Jarrett	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

SMD 6)☒ Claim(s) 1-11 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 October 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/17/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figures 6 and 7A-7B are informal and/or illegible. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Title

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Estimating Customer Arrival Times and Queue Lengths Utilizing Transactional Data.

Claim Rejections - 35 USC § 101

3. Claims 1-6 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The basis of this rejection is set forth in a two-prong test of:

(1) whether the invention is within the technological arts; and

(2) whether the invention produces a useful, concrete, and tangible result.

For a claimed invention to be statutory, the claimed invention must be within the technological arts. Mere ideas in the abstract (i.e., abstract idea, law of nature, natural phenomena) that do not apply, involve, use, or advance the technological arts fail to promote the "progress of science and the useful arts" (i.e., the physical sciences as opposed to social sciences, for example) and therefore are found to be non-statutory subject matter. For a process claim to pass muster, the recited process must somehow apply, involve, use, or advance the technological arts.

Additionally, for a claimed invention to be statutory, the claimed invention must produce a useful, concrete, and tangible result.

Regarding Claims 1-6, Claims 1-6 only recite an abstract idea. The recited method for estimating customer arrival times does not apply, involve, use or advance the technological arts since all of the recited steps can be performed in the mind of the user or by use of a pencil and paper. The claimed invention, as a whole, is not within the technological art as explained above claims 1-6 are deemed to be directed to non-statutory subject matter. Correction required. See MPEP § 2106 [R-2].

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Mandelbaum, Avi et al., Estimating Characteristics of Queuing Networks Using Transactional Data (December 1997).

Regarding Claim 1 Mandelbaum et al. teach a method for determining a plurality of queue performance metrics (length, wait time, arrival times, etc.) utilizing transactional data (operational data, transaction times, etc.) for one or more (a plurality) of terminals (service stations; Abstract; Section 1.1, Page 1).

Mandelbaum et al. further teach that research into estimating queue characteristics (metrics, measures, performance, etc.) of queuing networks utilizing transactional data is old and well known (Section 1.2 Survey of Literature, Pages 2-3) . Mandelbaum et al. specifically cites the work by Larson wherein transactional data is used to group transactions (users, customers) into busy periods as well as determine/infer the queue length and other metrics (queue inference, queue inference engine (QIE); Section 1.2, Paragraphs 2-4, Page 1).

Mandelbaum et al. teach a method for estimating (determining, calculating, forecasting, etc.) customer arrival times at one or more terminals (devices, service stations, servers, etc.) comprising:

- extracting (receiving, obtaining, collecting, etc.) service time data (e.g. transaction start, end, etc.; Abstract; Section 1.1, Bullet 1, "transactional data is relatively easy to access", Page 1) from one or more terminals (e.g. "Automated Teller Machines", "face-to-face services"; "servers"; Section 1.1, Page 1; Section 3.1, Page 18);

- grouping customers (users, transactions, requests, etc.) into busy periods (Section 1.4 "Busy-Period Interpolation", Pages 4; Section 2: Busy-Period Interpolation, Page 7); and

- estimating customer arrival times for each busy period based on the service time data (transactional data; Section 2.2, Pages 8-9; Section 2.4, Pages 14-15; Representation of 1' of E_t via Arrival Times – Unknown External Arrivals, Page 20; Representation of 2' of E_t via Arrival Times – Unknown External Arrivals, Pages 22-23; "the objective was to infer, if necessary, their arrival times (internal or external).", Paragraph 4, Page 24).

Regarding Claim 2 Mandelbaum et al. teach that the method for estimating customer arrival times further comprises:

- constructing (determining, calculating, etc.) a queue length for each busy period (Paragraphs 3-4, Page 24; Proposition 4.1, Pages 27-28, Paragraph 3, Page 28; Figures 6.1-6.6); and

- calculating queue performance measures (metrics, parameters, values) based on the queue lengths ("Analyzing new performance measures, such as waiting-time distributions during a busy period or fraction of customers who wait more than τ minutes.", Bullet 3, Page 50).

Regarding Claim 3 Mandelbaum et al. teach that the method for estimating customer arrival times further comprises outputting (providing, displaying, exporting, graphing, etc.) the calculated performance metrics for analysis for each of the plurality of terminals ("Automated Teller Machines", "face-to-face services"; Section 1.1, Page 1; Section 3.1, Page 18; Figures 6.1-6.6; Tables 3-5).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 4-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mandelbaum, Avi et al., Estimating Characteristics of Queuing Networks Using Transactional Data (December 1997), as applied to claims 1-3 above.

Regarding Claims 4-5 Mandelbaum et al. teach a method for estimating customer arrival times comprising one or more (a plurality) terminals ("Automated Teller Machines", "face-to-face services"; Section 1.1, Page 1; Section 3.1, Page 18).

Mandelbaum et al. does not expressly teach that the terminals (servers, systems, etc.) are point-of-sale terminals as claimed.

As per applicant's own admission estimating queue parameters (length, wait, etc.) utilizing transactional (service-time) data from point-of-sale terminals is old and well known (Specification: "Commercially available point-of-sale terminals collect transaction data that is used ...", Lines 12-13, Page 2; Specification: Lines 26-27, Page 2, Bertsimas, Dimitris et al., Deducing Queuing From Transactional Data: The Queue Inference Engine, Revisited, 1991: "...examples include checkout counters at

supermarkets....", Paragraph 1, Page 1; "Step 5 Estimates of transient queue length", Page 3; Figures 1-4).

It would have been obvious to one skilled in the art at the time of the invention that the method for estimating customer arrival times based on a plurality of collected transactional service data, with its applicability to ATM and face-to-face service transactions, as taught by Mandelbaum et al. would have benefited from collecting transaction data for any of a plurality of service related devices including but not limited to point-of-sale transaction data; the resultant system enabling businesses that utilize point-of-sale terminals to determine a plurality of queue performance metrics thereby enabling them to better understand and/or manage the customer queues associated with those point-of-sale terminals.

Regarding Claim 6 Mandelbaum et al. teach that the method for estimating customer arrival times further comprises outputting (providing, displaying, exporting, graphing, etc.) the calculated performance metrics for analysis for each of the plurality of terminals ("Automated Teller Machines", "face-to-face services"; Section 1.1, Page 1; Section 3.1, Page 18; Figures 6.1-6; Tables 3-5).

Mandelbaum et al. does not expressly teach that the terminals (servers, systems, etc.) are point-of-sale terminals as claimed.

As per applicant's own admission estimating queue parameters (length, wait, etc.) utilizing transactional (service-time) data from point-of-sale terminals is old and well known (Specification: "Commercially available point-of-sale terminals collect transaction data that is used ...", Lines 12-13, Page 2; Specification: Lines 26-27, Page 2, Bertsimas, Dimitris et al., Deducing Queuing From Transactional Data: The Queue Inference Engine, Revisited, 1991: "...examples include checkout counters at supermarkets....", Paragraph 1, Page 1; "Step 5 Estimates of transient queue length", Page 3; Figures 1-4).

It would have been obvious to one skilled in the art at the time of the invention that the method for estimating customer arrival times based on a plurality of collected transactional service data, with its applicability to Automated Teller Machine and face-to-face service transactions, as taught by Mandelbaum et al. would have benefited from outputting the generated performance measures for each of the point-of-sale terminals; the resultant system enabling businesses that analyze the plurality of queue performance metrics thereby enabling them to better understand and/or manage the customer queues associated with those point-of-sale terminals.

Regarding Claim 7 Mandelbaum et al. teach a method for estimating (determining, forecasting, calculating, etc.) queue lengths (size) of customers at one or terminals comprising:

- extracting (collecting, obtaining, receiving, etc.) service time (event, transaction, etc.) data from one ore more terminals (systems, subsystem, etc.; Abstract; Section 1.1, Bullet 1, "transactional data is relatively easy to access", Page 1; "Automated Teller Machines", "face-to-face services"; "servers"; Section 1.1, Page 1; Section 3.1, Page 18);

- grouping customers into busy periods (Section 1.4 "Busy-Period Interpolation", Pages 4; Section 2: Busy-Period Interpolation, Page 7);

- estimating customer arrival times for each busy period (Section 2.2, Pages 8-9; Section 2.4, Pages 14-15; Representation of 1' of E_t via Arrival Times – Unknown External Arrivals, Page 20; Representation of 2' of E_t via Arrival Times – Unknown External Arrivals, Pages 22-23; "the objective was to infer, if necessary, their arrival times (internal or external).", Paragraph 4, Page 24);

- constructing (determining, calculating) a queue length for each busy period (Paragraphs 3-4, Page 24; Proposition 4.1, Pages 27-28, Paragraph 3, Page 28); and

- calculating queue performance metrics based on the calculated queue lengths (Bullet 3, Page 50).

Mandelbaum et al. does not expressly teach that the method for estimating queue lengths is automated or subsequently that the service time/transactional data is stored in a storage device as claimed.

It was known at the time of the invention that merely providing an automatic means to replace a manual activity which accomplishes the same result is not sufficient to distinguish over the prior art, In re Venner, 262 F.2d 91, 95, 120 USPQ 193, 194 (CCPA 1958). For example, simply automating the method of estimating queue lengths using transactional data collected from a plurality of terminals gives you just what you would expect from the manual method as shown in Mandelbaum et al. In other words there is no enhancement found in the claimed aparatus. The claimed apparatus for estimated queue lengths only automates the manual activity. The end result is the same as compared to the manual method. A computer can simply iterate the steps faster and provide a convenient mechanism for storing the transactional data; the result is the same.

It would have been obvious to one skilled in the art at the time of the invention to automate the method of estimating queue length based on transactional data at taught by Mandelbaum et al. because this would speed up the process of estimating queue lengths of customers at a terminal, an expected result from automation of what is known in the art.

Regarding Claims 8 and 11 Mandelbaum et al. teach that the method and system for estimating queue lengths further comprises outputting (providing, displaying, exporting, etc.) the calculated performance metrics for analysis for each of the plurality of point-of-sale terminals ("Automated Teller Machines", "face-to-face services"; Section 1.1, Page 1; Section 3.1, Page 18; Figures 6.1-6; Tables 3-5).

Regarding Claims 9-10 Mandelbaum et al. teach a method for estimating queue lengths comprising one or more (a plurality) terminals ("Automated Teller Machines", "face-to-face services"; Section 1.1, Page 1; Section 3.1, Page 18).

Mandelbaum et al. does not expressly teach that the terminals (servers, systems, etc.) are point-of-sale terminals as claimed.

As per applicant's own admission estimating queue parameters (length, wait, etc.) utilizing transactional (service-time) data from point-of-sale terminals is old and well known (Bertsimas, Dimitris et al., Deducing Queuing From Transactional Data: The Queue Inference Engine, Revisited, 1991: "...examples include checkout counters at supermarkets....", Paragraph 1, Page 1; "Step 5 Estimates of transient queue length", Page 3; Figures 1-4).

It would have been obvious to one skilled in the art at the time of the invention that the method for estimating customer arrival times based on a plurality of collected

transactional service data, with its applicability to Automated Teller Machines and face-to-face service transactions, as taught by Mandelbaum et al. would have benefited from collecting transaction data for any of a plurality of service related devices including but not limited to point-of-sale transaction data; the resultant system enabling businesses that utilize point-of-sale terminals to determine a plurality of queue performance metrics thereby enabling them to better understand and/or manage the customer queues associated with those point-of-sale terminals.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Katsof et al., U.S. Patent No. 4,700,295, teach a system and method for forecasting customer arrivals (bank traffic) at a terminal (teller) wherein the system collects operational data (customer arrival, departure, service time, etc.) and utilizes well-known queuing models to determine a plurality of queue metrics (waiting time, etc.).

- Nelson et al., U.S. Patent No. 5,290,107, teach a method and system for forecasting customer arrivals (customer traffic) at one or more terminals (point-of-sale, checkout lanes) wherein the system collects and analyzes a plurality of operational data including but not limited to service times from point-of-sale transactional data, in order to calculate a plurality of queue performance metrics (customer wait time, maximum queue length, etc.). Nelson et al. further teach that forecasted customer arrivals are displayed.

- Oka, Yukihiko, U.S. Patent No. 5,408,210, teaches a method and system for determining and indicating the dynamic queue length for one or more terminals (point-of-sale, electronic cash register).

- Costantini et al., U.S. Patent No. 5,506,898, teach a system and method for determining the queue performance metrics (wait time) based on operational/transactional data collected by a terminal (e.g. ACD system).

- Deaton et al., U.S. Patent No. 5,621,812, teach a method and system for collecting and storing (database) a plurality of transactional (event) data at a point-of-sale terminal.

- Whitt, Ward, U.S. Patent No. 6,023,681, teaches a method and system for determining queue performance (e.g. wait time, queue length) metrics utilizing service-time data.

- Knapp et al., U.S. Patent No. 6,829,583, teach a method and system for determining queue performance metrics (mean-time-to-service) at one or more terminals utilizing collected service-data.

- Matsko, Michael James, U.S. Patent Publication No. 2005/0038695, teaches a system and method for capturing and storing a plurality of transactional (event) data at a point-of-sale terminal.

- Daley D.J. et al., Exploiting Markov chains to infer queue length from transactional data, teaches a method for calculating the dynamic length of a queue utilizing transactional data recorded at a terminal (device, computer, automated teller machine, etc.).

- Hall, Susan, New directions in queue inference for management implementation, teaches that queue inference is a well known method for utilizing service time data (i.e. transaction data) from terminals, including but not limited to point-of-sale terminals, to determine (calculate, estimated) queue measurements (parameters, performance, statistics, etc.).

- Patel, Susmit, Performance Inference Engine (PIE), teaches a method and system for calculating queue performance measures (metrics, parameters) from transactional data collected from one or more terminals (e.g. automated teller machines). Susmit further teaches that the PIE method and system groups customers (users) into busy periods as part of a busy cycle. Further Patel teaches that the PIE method and system is based on the old and well known work on queue inference engines (QIEs) that utilize order statistics and/or Markov chains to calculate queue metrics.

- Daley, D.J., The Busy Period of the M/GI/∞ Queue, teaches the characteristics of a busy period for a M/GI/∞ queue.

- Bolch, Gunter et al., Queuing Networks and Markov Chains, teaches a plurality of old and well-known methods for determining a plurality of queue parameters.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott L. Jarrett whose telephone number is (571) 272-7033. The examiner can normally be reached on Monday-Friday, 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hafiz Tariq can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SJ
8/16/2005

Susanna Diaz
SUSANNA M. DIAZ
PRIMARY EXAMINER
AU 3623